

I claim:

1. A wafer carrier comprising a means for securing and holding a wafer, said wafer carrier further comprising:

a mounting plate;

5 a retaining ring slidably attached to the mounting plate such that the retaining ring may move a distance along the axis of the wafer carrier, said retaining ring having a groove disposed therein;

10 a ridge extending into the groove, wherein the ridge extends from a component of the wafer carrier selected from the group consisting of the mounting plate and the retaining ring; and

15 an inflatable bladder disposed within the groove, said inflatable bladder sized and dimensioned to substantially conform to the size and dimensions of the groove.

2. The wafer carrier of claim 1 wherein the inflatable bladder comprises a resilient tubular hoop.

20 3. The wafer carrier of claim 1 further comprising a fluid supply tube in fluid communication with the inflatable bladder, said fluid supply tube operably connected to a means for regulating the pressure in the inflatable bladder.

25 4. The wafer carrier of claim 1 wherein the ridge is further sized and dimensioned such that when the inflatable bladder is disposed in the groove the inflatable bladder deforms to very closely conform to the dimensions of the groove.

5. The wafer carrier of claim 1 wherein the groove is bounded by a floor, an inner wall and an outer wall, and wherein the ridge extends upwardly from the floor.

6. The wafer carrier of claim 5 wherein the groove has a rectangular radial cross section.

7. The wafer carrier of claim 6 wherein the ridge is symmetrically disposed between the inner wall and the outer wall.

8. The wafer carrier of claim 5 wherein the ridge extends about 0.030 inches from the floor of the groove.

9. The wafer carrier of claim 1 further comprising a shim disposed between the mounting plate and the retaining ring.

10. A method of polishing a wafer, said method comprising the steps of:

15 providing a wafer carrier comprising a means for securing and holding a wafer, said wafer carrier further comprising:

a mounting plate;

20 a retaining ring slidably attached to the mounting plate such that the retaining ring may move a distance along the axis of the wafer carrier, said retaining ring having a groove disposed therein and said retaining ring characterized by a bottom surface;

25 a ridge extending into the groove, wherein the ridge extends from a component of the wafer carrier

selected from the group consisting of the mounting plate and the retaining ring; and

an inflatable bladder disposed within the groove, said inflatable bladder sized and dimensioned to substantially conform to the size and dimensions of the groove;

securing a wafer to the wafer carrier; and

polishing the wafer by pressing the wafer and wafer carrier onto a polishing pad, wherein during polishing the retaining ring substantially prevents the wafer from moving radially with respect to the axis of the wafer carrier, and wherein the bottom surface of the retaining ring remains at a pre-determined height with respect to the front side of the wafer.

11. The method of claim 10 wherein the pre-determined height is about in the range of about 0 inches to about 5 thousandths of an inch.

12. The method of claim 10 wherein the bottom surface of the retaining ring applies a pressure to the polishing pad in the range of about 0 PSI to about 12 PSI during polishing.

13. The method of claim 12 wherein the pressure in the inflatable bladder is in the range of about 1 PSI to about 60 PSI.

14. The method of claim 10 comprising the further steps of:

providing a means for regulating the pressure in the inflatable bladder; and

maintaining the pressure in the inflatable bladder as the bottom surface of the retaining ring is worn, thereby expanding the inflatable bladder, forcing the retaining ring towards the polishing pad and causing the bottom surface of the retaining ring to remain at a pre-determined height relative to the front side of the wafer.

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15. The method of claim 14 wherein the pre-determined height is about in the range of about 0 inches to about 5 thousandths of an inch.

16. The method of claim 14 wherein the bottom surface of the retaining ring applies a pressure to the polishing pad in the range of about 0 PSI to about 12 PSI during polishing.

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17. The method of claim 16 wherein the pressure in the inflatable bladder is in the range of about 1 PSI to about 60 PSI.